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SCIENTIFIC AFFAIRS

No. 537

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TRANSLATIONS ON EASTERN EUROPE

SCIENTIFIC AFFAIRS

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CONTENTS PAGE

USSR-GDR COMPUTER TECHNOLOGY COOPERATION

East Berlin PRESSE-INFORMATIONEN in German 22 Dec 76 pp 2-3

[Article by Dr Wolfgang Sieber, general director of the Robotron Combine VEB]

[Text] A new chapter in the relations between the two countries began with the treaty on friendship, cooperation and mutual assistance between the USSR and the GDR. The main directions of their cooperation have been established on a long-term basis. The consequences will be effective in their entirety also in terms of increasingly close and ever more effective cooperation and specialization in the area of electronic computer technology. But the Robotron Combine VEB is not the initiator in this. There is already a great wealth of practical experiences, a cadre that has developed in the process of joint work with Soviet collectives, and important scientific-technical and economic results from cooperation of more than 6 years, which has been constantly in a state of development.

The most important result, and since 1974 the most effective in production and marketing, has been the EC 1040 electronic data processing system. It is a part of the "uniform electronic data processing system" [ESER] developed in CEMA countries under the direction of the Soviet Union. The system is in use not only in the GDR. It is also being successfully used in the USSR, the CSSR, the Hungarian People's Republic and the People's Republic of Bulgaria, thus making substantial contributions to the rationalization of the management and planning processes and to intensification in the countries of the socialist community. This accomplishment became possible because of the utilization and development of the capabilities of socialist economic integration and thus especially of close scientific-technical cooperation with the Soviet Union.

Specialization Covers the Entire Reproduction Process

An essential basis for effective economic use of systems of the ESER is smooth integration, both in terms of equipment and programs, of electronic data processing systems of established performance into an overall system which can be expanded in either direction. From this statement, which at first seems simple, there follows, however, a variety of complicated and extensive tasks in research and development. Examples of that are the preparation and determination of uniform principles of operation for such a computer family, far-reaching standardization in technology and program technology, the standardization of basic solutions on to the development of central processing units which divide the work, peripheral units and operating systems. All that cannot be solved by one country like the GDR or by a combine such as the Robotron Combine VEB alone. Moreover, the joint political and economic goals make it virtually essential to use as effectively as possible the scientific-technical potential present in our countries.

Today more than 80 percent of our research and development topics are derived directly from cooperation with the USSR, primarily within the framework of the ESER and the "system of miniature computers," while in 1971 the figure was still just about 30 percent. Now, in further work it is a matter of utilizing the broad experiences gained in this regard in a logical manner for the solution of the new, expanded tasks. The start for that lies in increasingly extending planning of cooperation and specialization no longer just to the development process, but rather to the entire reproduction process, proceeding on the basis of the development of the demand and the possibilities of meeting it.

With the further development of the ESER and the "system of miniature computers" the extensive involvement of the research phase has also turned into cooperation and specialization for long-term acceleration of scientific-technical progress in the area of computer technology and its use for a highly topical task. In this regard a first important step is the determination of the goal and the main directions of long-term development of computer technology and its application in accord with the social conditions of development in our countries. In cooperation with Soviet collectives, in the ever better utilization of the sources here that can be opened up for accelerating scientific-technical progress the high responsibility which socialist intelligence has vis-a-vis the working class is apparent and proves itself.

Extensive Field of Application in Both Countries

The results of the scientific-technical cooperation with the Soviet Union have a line of direct continuation in the foreign trade relations of the two countries. Since 1973 it has been possible to conclude foreign trade agreements between the foreign trade enterprises of GDR business machine exports and USSR Electronorgtekhnika for the export of the EC 1040 electronic data processing systems and for the import of the EC 1020 electronic data processing system or the EC 1022 successor system. Up to the present more than 30 EC 1040 electronic data processing systems have been delivered to Soviet users. They are being used primarily for the solution of scientific-technical and economic tasks.

Important scientific institutions in the Soviet Union and significant industrial projects of its economy number among the potential users. In the largest Soviet automobile factory on the Kama the EC 1040 is implementing tasks of planning, storage and movement of goods. The petroleum industry association "Glavtyumenneftgas" in Western Siberia has available a Robotron machine for various scientific-technical and also economic calculations and evaluations. Additional users are, for example, the central administration for statistics and the state committee for the material-technical supply of the USSR economy. A computer of the EC 1040 type is set up in the international center for scientific and technical information, and not the least our electronic data processing systems contribute to fulfilling the international research programs in the United Institute for Nuclear Research in Dubna. The quality of the equipment of the EC 1040 system and the reliable work of the units are emphasized by all Soviet users.

At present in the GDR economy more than 50 electronic data processing systems of Soviet manufacture are in use, the EC 1020 and EC 1022 respectively. They likewise serve, on a priority basis, for the solving of scientific-technical and economic tasks. These systems have already proven their worth in numerous computer centers of the councils for the agriculture and forestry and foodstuffs industry, the GDR railroad, computer enterprises for domestic trade and in a series of data processing centers of the association of state enterprises for mechnical calculating. A larger number of our universities, advanced schools and academic institutions are likewise equipped with Soviet data processing technology.

Long-term accords and agreements will guarantee in the coming years the mutual delivery of ESER computers in larger numbers between the USSR and the GDR and thus an effective use of electronic computer technology in both countries. The broad and varied experiences are a prerequisite for the fact that we will solve, in significantly closer cooperation and specialization with the USSR, the tasks which have been given to us for the 1976-1980 period to increase tempo and effectiveness in the area of computer technology.

Peripheral equipment from the Soviet Union, the People's Republic of Bulgaria, the Polish People's Republic, the Hungarian People's Republic and the Czechoslovak Socialist Republic forms a part of the EC 1040 electronic data processing system. It is the basis for making available operating systems as a prerequisite for the operation of equipment technology in general. The disc operating system DOS/ES is being developed in its basic version in the GDR; the operating system OS/ES is being worked out together with the Soviet Union and under its direction. Hundreds of thousands or millions of commands are contained in these two information storage systems and are linked together.

Which user programs are to be used and how efficiently they are developed is decisive for effectiveness in the use of computer technology. The Robotron Combine VEB, in close cooperation with Soviet partner installations, is working out programs, program modules and systems which in use demonstrate a high degree of rerun. Thus, the jointly developed program systems Bastei and Aidos have been successfully tested and introduced in enterprises and installations in the Soviet Union. In the years after 1977-1978 the first Soviet development results for problem-oriented information processing will be available for the GDR, the so-called ASU [automatic control system]-type elements.

As part of the government agreement creating a "uniform electronic communications system (ESEN)" work on developing special computers for control of message switching has been carried out for several years in the Robotron Combine VEB in the closest cooperation with the USSR. In this matter extensive forms of division of labor were successfully applied and tested in the development process, which can also serve as an example for other future tasks.

The logical design of computers was worked out by Soviet scientists, the design-technological development process was carried out by Robotron engineers Putting the computer into operation took place under Soviet direction and with the participation of a Soviet collective of specialists in the Robotron Combine VEB.

12124
CSO: 2302

ALBANIA

SHORTCOMINGS IN GEOLOGICAL STUDIES CITED

Tirana ZERI I POPULLIT in Albanian 28 Dec 76 p 3

[Article by Prof. Eshref Pumo: "Thorough and Integrated Geologic Studies"]

[Text] In developing the different branches of industry and of the people's economy as a whole, the party has relied primarily on the country's mineral wealth and its assimilation.

The geology workers, under the guidance of the party organizations, have persistently striven to perform and overfulfill the tasks entrusted to them from one five-year plan to the other. Educated in the teachings of the party and Comrade Enver, they have overcome the difficulties of growth and caused the ignominious failure of all the plans of domestic and foreign enemies--and especially of the Khrushchevian revisionists--who have tired to convince us that the Albanian deposits are "small," that our minerals are "poor," that there is no "economic" profitability in setting up a processing industry, and that our resources should be processed in their plants and factories, and so on. All these things were aimed at obstructing and sabotaging the development of a heavy industry in our country and thus to make our industry dependent upon theirs.

In striving to perform the tasks of our country's geologic service in these 32 years since the Liberation, especially since 1960, we have obtained much new data to gain a thorough knowledge of the geologic structure of the whole country, we have deduced a good many natural laws about the distribution of useful minerals, we have fulfilled the tasks of insuring industrial reserves of the main useful minerals, we have found new minerals, and we have done a comprehensive job in training the higher and medium cadres of skilled workers. As a consequence of all these achievements, it has become possible for our country to change from a land with two or three small mines and a small petroleum production into a state with a many-branched advanced industry: the full processing of copper ores within this country, the full-cycle refining of oil, and the production of an Albanian brand of cast iron and steel, the rapid growth of the chrome industry, and other accomplishments grounded on the reserves of mineral raw materials discovered during the years of the people's rule have been a very important factor not only for the all-around growth of industry and the development of agriculture, but also for breaking the fierce imperialist-revisionist blockade and strengthening the economic independence of our socialist fatherland.

In the new five-year plan too, the rapid and secure development of industry is tied directly to the expansion of the mineral extracting and processing industries, which will continue to have higher rates of development than any other branches of industry.

The successful performance of these tasks requires that special care be shown in operations and exploration, the importance of which must be better understood by the party organizations and the collectives of the geologic enterprises. In this respect, we must combat the underestimating manifestations that have occurred in certain cases during the last few years. Without lowering the rate of discovery, and while giving priority to exploration operations and adopting more correct relations between the geologic reserves and the industrial ones, an important turnaround must be effected during the Sixth Five-Year Plan in understanding the importance of exploration and in enhancing its foremost role in the entirety of geologic discovery operations, both for the useful minerals now known and for deposits of new useful minerals.

It is our duty to merge all our forces and capacities on a broad and responsible exploration front and to cooperate closely, arm in arm, with the local prospectors in studying and evaluating the surface part of our territory, which in the future, too, will be an important source of deposits of useful minerals, known or unknown.

But without neglecting or underrating surface exploration, it is necessary for us, with courage and faith in our own forces, to program and explore for deposits that do not appear on the surface. This task requires systematic, organized and well coordinated studies, with the participation of many specialists, since one cannot proceed by guesswork or empirical methods in solving these tasks, but must always rely most strongly upon thorough and comprehensive studies. The integration [kompleksitet] of geological operations cannot be conceived solely in the combination of the most effective geologic-geophysical and geochemical methods, but in every direction.

The integration of geologic operations presupposes evaluation of a whole area or region for all kinds of possibly useful minerals, for all the main and accompanying useful elements. Considering from this angle the geologic map to be prepared from the new data in the coming years, the work program for it will include studies reflecting and throwing more light on the regional premises for exploration and the laws governing the location of mineralization.

In the report submitted by Comrade Enver Hoxha to the seventh party congress, he drew attention to the fact that our geologic service has suffered from a lack of strict scientific discipline and thorough and well argued studies. There are cases where certain geologic reports are lacking, or the studies presented on the composition and physical-mechanical properties of the rocks are insubstantial and the data on the hydrogeologic studies are insufficient. These shortcomings, which are a consequence of the hostile work of Abdyl Kellezi and Koco Theodhosi, have been forcefully criticized in the party organizations and the meetings of the collectives and have begun to be corrected. A complete mobilization of all the specialists to establish strict scientific discipline is now required, beginning with the simplest tasks and problems and extending to the major scientific generalizations. In the whole work of exploring for and discovering minerals, the party's injunction must be borne in mind, namely that geology is a science with a strict discipline requiring controllable accuracy, based on thorough and integrated studies, exact generalizations and factual data, and contrary to guesswork and empirical methods.

All our work, especially in exploration, is grounded on the well-known principles of the dialectic method in evaluating geologic data under concrete conditions. We must be carefully guided by principles in passing from the known parts of deposits to those less known, from relatively well studied deposits to more promising new areas, from signs and outcrops of ore bodies and mineralized areas on the surface to those deep down, from clarification of laws of a general regional character to a knowledge of local laws, hence from the general to the particular, from involvement of the thinking of all the workers, technicians and cadres to arrival at conclusions and generalizations of theoretical and practical importance, to a knowledge of the conditions of joint association of minerals; and so on.

The seventh party congress also set great tasks for the qualitative increase in work with the higher and medium cadres. For this purpose, the higher and middle schools must raise to a higher degree the level of educational and instructional work on scientific research activity in conformity with the tasks relating to the fulfillment of the program for further revolutionizing the schools and their ties with production.

10002
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EAST GERMANY

IMPORTANCE OF INTERDISCIPLINARY RESEARCH IN DEVELOPING NEUROLOGICAL SCIENCES

East Berlin SPEKTRUM in German Sep 76 pp 10-13

/Article by Hansjuergen Matthies, Director of the Magdeburg Medical Academy and of the Institute of Pharmacology and Toxicology: "Interdisciplinary Research and the Development of the Neurosciences"/

/Text/ Ever since man as a conscious being began to reflect on the conditions of his own existence and on his relationship to nature and society, he has grappled with the seemingly unsolvable contradiction between the physical, tangible and the mental, incomprehensible; he has tried to gain a deeper understanding of the psychic processes and has sought access to the most profound knowledge on himself.

However, for many centuries up to the recent past, these processes remained largely obscure. For the most part, they remained the subject of pre-scientific conceptions and of philosophic speculations. But this gap in knowledge was not merely a matter of epistemology; it also prevented the solution of many practical problems in medicine, education and many other social fields.

Along with the rise of the natural sciences, which in close interaction with the development of the productive forces took place at first gradually and subsequently more and more rapidly, the intellectual activity itself and the organ forming its material basis, namely the nervous system with the brain, attracted man's analytical and increasingly rational-critical attention. Anatomists dissected it and examined its microstructure under the microscope; physiologists discovered the electric manifestations of the nerve function and the complex functional interrelationships; pharmacologists found numerous possibilities of influencing its activity, and biochemists determined the composition of its material constituents. In this way, many partial processes were analyzed and although the knowledge derived was applied in practice, the total picture remained hard to grasp and incomprehensible. Moreover, these advances were largely disconnected from the attempts to understand the inherent patterns of the psychic processes in terms of their proper categories.

Not until relatively late did psychology free itself from the fetters of idealistic philosophic speculation by seeking its reference points in biological and social reality, by employing experimental methods and assuming a materialistic position. This created an essential precondition for subjecting the relationship between the mental and the physical spheres to a concrete scientific examination.

The distinctly analytical mode of operation led to a tremendous increase in detailed knowledge and in various complex methods which in a short time could no longer be mastered and kept track of by the individual scientist. Specialization became unavoidable. The scientist had to restrict himself to thoroughly understanding just one limited field of study. Thus there developed within the framework of the biomedical partial sciences narrower special fields, which today are relatively independent and which are divided into fields of study: Out of morphology, there grew neuromorphology; out of physiology, neurophysiology, and out of biochemistry, neurochemistry. Psychotherapy detached itself relatively early from internal medicine, and at least as far as research is concerned, a subdivision into psychiatry and neurology is becoming apparent. Internal patterns as well as external factors and social conditions determined this process of specialization; they also resulted in rather contradictory phenomena. Border areas between two scientific fields were opened up from both sides and gave rise to two similar, but not congruent new partial fields: Psychophysiology, psychobiology and the physiology of higher nerve function correspond to each other in many aspects; on the other hand, they also differ in undefined ways. This development, which for all its inconsistencies followed a certain pattern, entailed considerable dangers. With specialization, there is the danger of losing control over the whole, of failing to grasp the interrelationships. Moreover, the partial fields, which are only loosely connected, create their own terminology, their own language, and thus -- not surprisingly in view of the dialectics of language and thought -- their own conceptual worlds and thought categories. The isolation of the partial fields was encouraged and comprehension of the interrelationships was made difficult, since many individual scientists failed to notice that a comprehensive theoretical concept, namely the Marxist theory of cognition -- which overcomes the supposed incompatibility of mind and matter --, had been available in its general fundamentals for a long time. The ingenious synthesis of Hegel's dialectics with Feuerbach's materialism, the integration of the concept of development, and the basic idea of the unity of nature and society -- as outlined by Marx and Engels, further developed in an argumentative fashion by Lenin and enriched by the theory of reflection --, all these elements along with the more recent information-theoretical and cybernetic aspects supplied those foundations for generalizations and possibilities of abstraction, which the individual sciences needed. Not until these theoretical foundations were established was it possible to discern correctly the dialectical relationships between the organizational levels of matter and to derive therefrom a deeper understanding of the properties and functions of the nervous system and to develop successful strategies for further research. For the elucidation and comprehension of the functions of the nervous system, the observance of the specific inherent patterns of the individual organizational levels of matter is of far greater importance than for many other scientific problems, for nowhere else do the range of perception and the spectrum of methods and specialized disciplines, which are necessary for the solution of a research problem, extend from the molecular level to the level of interindividual and social organization.

The complexity of the problems resulting from this is apparent from the research targets which owing to the growing social interest and the present scientific advances are increasingly becoming the object of concrete research work: The causes and conditions of development of schizophrenia and other so-called endogenous psychoses. In view of the fragmentary state of present knowledge, it seems justified to assume that metabolic disorders in the nerve cells of the brain are an important factor in the development of these diseases; attention is directed especially to the formation of abnormal products of the neuronal carrier substances. Such metabolic disorders can be caused by exogenous factors, such as certain elements of nutrition or noxious substances; but they can also be based on genetic defects. Owing to the specific function of the brain as an information-processing central organ, the effects of such disorders of the cell metabolism -- in contrast to other metabolic disorders -- are not on the level of molecular-biological or biochemical processes, which methodically is accessible by similar approaches, but in the realm of psychopathology and in the concepts and conceptions peculiar to this partial field, which are oriented toward psychological laws; these concepts in their causal structure are naturally based on special social, environmentally conditioned factors of information. For this reason alone, they appear unusual to the biologically oriented scientist. Apart from this, owing to the incompleteness of our knowledge in this field, the psychopathologist is forced to think more in phenomenological than in causal categories. On the other hand, there can be no doubt that the development of an endogenous psychosis is to a large extent dependent on social factors, conflicts, psychic traumas, stress and other informational stimuli from the environment; and these determinants are so significant that the hypotheses as to an exclusively socially caused schizophrenia can be quite convincing. Thus the starting point for the practical setting of the problems and for the scientific solutions is not on the same level with the presumable causal events and the methodical approaches necessary for their examination and explanation. These problems are aggravated by the ethical barriers, which prevent the human brain -- in contrast to many other organs -- from being examined directly within the framework of a specific and systematic experiment. Here more than in other fields, this brings up the question concerning the applicability of models based on animal experiments. One would certainly be inclined to deny this possibility from the outset, and such an attitude is in agreement with the general and hitherto accepted view. However, I think that we should reexamine this standpoint, which is not free from bias, by considering the epistemological aspect as well as our present level of knowledge: So far, there are no indications that human and animal nerve cells differ in their metabolism and in their basic physiological functions. The special accomplishments of the human nervous system certainly rest only on the significantly higher level of structural organization, which is biogenetically acquired, and -- based on this in constant interaction -- on the elements of social organization, such as language and work. According to this point of view, schizophrenia is a disturbance precisely of the special capacities of the human nervous system with its inseparability from the specifically human, social environment. But this disease cannot be used as a model, as long as it derives its definition exclusively from a phenomenologically oriented psychopathology. However, if we assume -- and much can be said in support of this view -- that a metabolic disorder of nerve cells can at least be regarded as an essential causal factor, similar biochemical and physiological defects could also be present in animals or could be experimentally produced. Unquestionably, they would be a suitable model amenable to scientific study, regardless of the fact that phenomenologically and by definition, the resulting disturbances of animal behavior would not represent schizophrenia. It will certainly be very difficult to put this procedure into practice, but with regard to this and many other problems, it appears necessary first to strive for a fundamental clarification of the standpoints.

I think the example quoted shows that for a significant increase in understanding, for crucial advances in research and for the resulting opportunities for practical application, a peremptory precondition is the overcoming of the contradictions resulting from the necessary specialization by means of interdisciplinary collaboration. And this all the more so, the further the range of perception concerning a scientific problem extends over several organizational levels of matter, as is the case in the clarification of the functions of the nervous system. And there is more involved here than merely a division of labor in solving the research problems. The interdisciplinary collaboration must extend to all phases and forms of the scientific work. In fact, the present situation shows that systematic collaboration based on a division of labor can hardly be effectively worked out without first making significant advances in developing the basic theoretical conceptions.

The efforts toward such approaches, the attempts at bringing together the diverging specialized fields are seen everywhere in international science. In the Anglo-American speech area, the concept of "neurosciences" has already been accepted; it is a term for an only vaguely definable cross-cutting science, which integrates all partial fields aiming at the clarification of the functions of the nervous system. The term "Neurowissenschaften" [neurosciences] has won recognition in the German language as well; it was included in the SED program adopted at the Ninth Party Congress as a scientific field worthy of special support. In the GDR, a Society for the Neurosciences has been active for several years. At the last symposium of a problem-oriented commission of the Academies of Science of the socialist countries, it was also attempted to coin the analogous Russian term "neuronauk." In addition to the more comprehensive term "Neurowissenschaften" (without clear demarcation, partial fields from biology, medicine and experimental psychology are incorporated, including both the fields of basic and applied research), the narrower concept of "Neurobiologie" has also found acceptance for neuroscientific basic research in biomedicine; the term is used to designate one of the principal research fields within the GDR system of organized science. During the last few years, there took place within this framework a relatively successful process of integrating the neurobiological research potential of our republic. This process was characterized by the attempt to achieve three essential objectives: The development of work-sharing collaboration among the most diverse partial fields in all phases of scientific work; the concentration on key subject areas, which are promising in regard to significant increases in understanding and socially important possibilities of utilization; and the improvement of the effectiveness of research by means of long-term planning and the dynamic optimization of research work. In attaining these objectives, the socialist cooperation, the mutual assistance and support was an essential element, without which many difficulties could not have been overcome. This cooperation was expressed through mutual study visits by the scientists involved, through the coordinated development of new methods and their subsequent adoption by the other research centers, through partial experiments carried out by the research teams equipped with the appropriate apparatus, and through the exchange of scientific information. By examining the same experimental model and, in some instances, the identical test material, it was possible significantly to reinforce the demonstrative effect of the results obtained by various methods in the individual research teams.

Of special importance for the scientific integration were the manifold forms of exchange of experience and views among the specialists; this exchange took place at symposia, during the consultations of the scientific council of the principal research field, at the meetings of the Society for the Neurosciences and at the four international neurobiological symposia held in Magdeburg, which were attended by an increasing number of scientists from the socialist and non-socialist countries. This growing attention is connected with the international recognition of the research results obtained in the individual research teams of the principal research field. These results were largely achieved through the intensive efforts of able, albeit numerically as yet insufficient, young scientific talent which has come to the fore in the individual research centers since the development of the principal research field.

In this connection, one must by no means pass over the difficulties and obstacles. The understanding for comprehensive work-sharing interdisciplinary collaboration is as yet rather unevenly developed. Such cooperation presupposes the ability to develop a prognostically well-founded theoretical conception including the various methodical aspects and -- based on this -- the detailed planning and organization of work. As yet, it has not been possible to eliminate thinking in the categories of one's own course of study or within the limits of the accustomed methodical repertoire. For example, it is difficult for many scientists to select or develop an object or experimental model, which would be suitable for more than just their own methodical framework. It often happens, without any justification, that subjective elements related to personal or professional prestige come consciously or subconsciously into play. It has been shown, however, that given a genuine readiness for interdisclipinary research collaboration, the participants were soon able to measure the accruing benefits by the results. In our principal research field, the greatest advances and achievements were likewise attained in those areas, where interdisciplinary, multi-methodical research was most developed. Thus a vital foundation was established for the extension of work-sharing cooperation within the framework of socialist integration. The first steps have already been taken as part of the program -- entitled "Neurophysiology and Physiology of the Higher Nerve Functions (INTERMOSG)" -- of the problem-oriented commission of the Academies of Science of the socialist countries. Since the coordinating function for the topic "Mechanism of Memory Formation" was delegated to the GDR, the results, which to a significant degree must be attributed to the development of work-sharing interdisciplinary research in this field, won especially precious recognition.

8760
CSO: 2302

HUNGARY

BRIEFS

TTX-200 TELETYPE SIGNAL CONVERTER--The TTX-200 signal converter made by TERTA [Telephone Factory] can be used as a communication link for tele-data processing systems established on teletyping networks and can also be connected to low-speed terminals. In addition, it can be used for the duplex transfer of synchronous or asynchronous data signals having a speed of 200 bits/s. When it is connected to a teletype machine, the operators can conduct service correspondence with its aid. The TTX-200 was developed primarily in response to the requirements of the Soviet post. As a result of the successful line test conducted in the Soviet Union in 1975, when it served as a component of the TAP-2 (ESZ-8502) TERTA terminal, it is being shipped in large quantity to the Soviet post. The post is building up a national teledata processing system with TERTA equipment through a tele-type network. The system operates indirectly in the first stage, but the latest investigations have established the technical possibility for a direct mode of operation. It is worth noting that at this latest system investigation a still more recent version of the TTX-200, supplemented with an automatic call unit, was operating beside the computer. [Budapest SZAMITASTECHNIKA in Hungarian Jan 77 p 10]

SATELLITE TRACKING ANTENNA -- The calibrating and testing of the special antenna of the satellite tracking station under construction at Taliandorogd have begun. The station is to be completed this year. The antenna, which will automatically track communications satellites, has a diameter of 12 meters. The facility at Taliandorogd will serve as a terrestrial space communications transmitting and receiving station. [Budapest NEPSZAVA in Hungarian 2 Feb 77 p 1]

PRODUCTION OF COMPUTER PERIPHERALS -- The Hungarian Opitical Works, MOM, has joined the computer program by manufacturing computer peripherals. Since this is combined with purchase and adaptation of licenses, it means the Works has joined the international vanguard in this field. Today such products account for 30 percent of the production of the Works. [Budapest NEPSZAVA in Hungarian 5 Feb 77 p 16]

CSO: 2502

PLANNED DEVELOPMENT OF DATA PROCESSING SYSTEM

Bucharest STIINTA SI TEHNICA in Romanian Nov 76 pp 15,16,32

[Unsigned article: "Development of Romania's Information Science During the 1976-1980 Five-Year Plan"]

[Text] Information science was born during the last quarter of our century. One of its characteristics is that its development and its importance in the life of the society have been closely bound to the invention and development of computers. That is why it was erroneously thought for some time that information science represented the science of computers. It is only recently that it became clear that information science represented the collection, organization, storage, retrieval, and processing of information, the computer being merely the principal instrument for the automatic processing of an increasingly large volume of information at increasingly large speeds.

At present, information science imposes itself through its spectacular manifestations. It is becoming the indispensable support of any technologic, scientific, or economic progress in the contemporary world. The growing importance of information science and its applications in the most diverse areas of human activity can be assessed by following the amazing penetration of its principal instrument, the computer. This extraordinary success of information science can be explained by the fact that the automatic processing of information, namely information science plus computer, and more recently the automatic remote processing of information, namely information science plus computer plus a suitable communication network, correspond to a strong social need, a prerequisite for maintaining progress in science and the economy.

In order to form an idea of the development of information science in the world, we will briefly mention some figures about the inventories of computers available in some countries. At the beginning of 1972, the number of computers installed in West Germany was 14,400, in England 13,600, in France 12,900, in Algiers 63, in Austria 69, in Brasil 1,219, in Canada 4,406, in Italy 3,168, and in Japan 11,237. By the end of 1975, the United States, Western Europe, and Japan used more than 300,000 computers, and by 1980 their number will increase to over 500,000.

The trend throughout the world is toward a growing number of minicomputers and small computers. This change in structure is based on a reduction in the price of computers. It is estimated that by 1980, the value of small and intermediate computers will be reduced by a factor of five, that of large computers by a factor of 10, and that the cost for performing a logic function will be 100 times lower than in 1970.

The introduction of data processing systems is a characteristic phenomenon and an absolute requirement for the present stage of technico-economic development in all the countries of the world. The interest of our party and state leadership in this problem, vital to Romania's entire national economy, took form in the Decision of the Central Committee of the RCP, published in April 1972, regarding the improvement of the socioeconomic information system, the introduction of management systems which use means of automatic data processing, and the endowment of the national economy with computation technology during the 1971-1980 period. This document was a turning point in the organization of management activities based on automatic data processing. It contains a number of provisions designed to provide the national economy with computation technology, and to train specialized personnel at the rate demanded by the rapid development of the country's economy. Among other things, it prescribed that more than 80 computation centers would be operational by 1975, and that the investments allocated to computation technology during the 1971-1975 period would amount to more than 5 billion lei, with more than 20,000 specialists to be trained during the same stage. For the 1976-1980 period, this document provides for the start of general functional systems, and of operative management systems of some branches and activities. At the same time, it provides for the interconnection of management systems which use automatic data processing, thus completing the data transmission network along special communication lines. Special attention has been devoted to the development of data banks. All of these measures will assure that after 1980, the national system of management with means of automatic data processing will be gradually completed, and that computers will become a powerful factor of progress.

On the basis of these measures, and in a short time interval, our country has developed its own computer technology industry, represented by a large enterprise which produces third generation computers, an enterprise which produces computer memories, an institute which designs computer techniques, and a central institute which writes applications programs for these computers. Romania presently manufactures medium and small capacity computers, peripheral and remote processing equipment, electromechanical calculators, and electronic desk calculators. We have established 95 computer centers, of which 20 are territorial centers, the rest operating within ministries, industrial centrals, large enterprises, and educational institutes, forming the first elements in our country's network of computater centers. As a result of these centers, more than 800 units have benefited from the support of information science.

During the five-year plan of the technico-scientific revolution, the 1976-1980 plan, the investment funds allocated by the state for information science are three times larger than those of the previous five-year plan. The development of information science during this period is defined by a program included in the 1972 decision, and which details the activities of the 1976-1980 period. This program includes a number of guidelines aimed at the use of significant funds for continuing and accelerating the endowment of units in our national economy with computer technology. Taking into consideration world trends in the endowment with computer equipment, the program provides for an increase in the capacity of computers which are manufactured in the country, together with a transition to the fabrication of minicomputers.

Our production is focused primarily on computers in the Felix family. In addition to the Felix C-256 machines which are considered throughout the world as medium capacity computers, we also produce the smaller capacity Felix C-32 computer. The Romanian industry also produces the FC-15 and FC-30 line of billing and accounting machines, which perform extremely well and are widely used in the economy. And finally, we manufacture the Felix C-801 pocket calculator, which can perform the current operations needed for economic management, and which is presently one of the most demanded computing instruments. The 1976-1980 five-year plan provides for increasing the capacity of computers which will be manufactured, as well as diversifying the production of minicomputers. As a result, we will be manufacturing Felix C-512 computers, which have twice the capacity of the Felix C-256, and we will produce 3.5 generation computers whose memory capacity is double that of the Felix C-512.

Another characteristic of this five-year plan is an expansion of remote information processing procedures. This means that each computer center will be connected to a certain number of enterprises through remote data processing means. The enterprises will be equipped with terminal stations, which as a rule will be composed of a minicomputer, a console, several cathode ray display terminals, a slow printer, and a card reader. These stations in turn, will be connected to the computer centers by means of standard telephone lines.

From the standpoint of final usage, Romania will produce two types of computers: universal computers, and process computers -- in particular minicomputers. Romania's information science will gradually penetrate into all industrial production activities. The beginnings of this process can already be seen at the Galati Steel Combine, the Suceava Cellulose Combine, the Hoghiz Cement Combine, and other industrial enterprises. During the present five-year plan, one of the characteristics of Romania's development of information science, is to continue and accelerate the penetration of this science in industry, thereby significantly contributing to the modernization of production processes, and improving the efficiency of all economic activities.

By the end of the current five-year plan, we will see the defining elements of the national information system, which will form the foundations of the future national informational system for management.

In accordance with the tasks assigned by the higher leadership of the party and state, information science in our country has been oriented toward the following six areas of activity:

Effective production management;
Technico-economic planning;
Technico-scientific calculations;
Optimization of material resources;
Personnel and salary records;
Financial and accounting problems.

These six categories of applications define a comprehensive information system, and for the fullest exploitation of programs which have been written, we have established a national program library administered by the Central Institute for Management and Information Science.

In terms of personnel training, during the current five-year plan more than 30,000 specialists will be educated in specialized high schools, higher education, junior college, and post graduate studies.

It can be rightly said that the development of Romania's information science is a basic component of the technico-scientific revolution in the 1976-1980 five-year plan. The achievements obtained until now, and the measures adopted for the current five-year plan will assure a growing development of information science, which will manifest itself as an indispensable factor of a modern economy, as a factor for accelerating progress in all sectors of economic and technico-scientific activities.

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LASER RESEARCH, USE DISCUSSED

Bucharest STIINTA SI TEHNICA in Romanian Nov 76 pp 10-12

[Article by Dr Vasile Draganescu: "Fifteen Years of Research and Applications in the Field of Lasers in Romania"]

[Text] On 20 October 1962, as a result of their advanced research, the physicists and engineers in the laser section of the Bucharest Institute of Atomic Physics (IFA) succeeded in obtaining a laser effect in a He-Ne gas mixture at the infrared wavelength of 1.5 microns, only one year after the same effect was obtained by American researchers. On that date, therefore, Romania became one of the first countries in the world to have built a He-Ne laser. After about another six months, we obtained super-radiation at 3.39 microns, and stimulated emission at 0.6328 microns (red) in He-Ne, thus creating the objective foundations for the subsequent development of laser devices for application purposes.

Following this, new problems had to be solved in order to produce a laser with stable, controllable, and reproducible performance: improving the mechanical stability of the device, optimizing the gas mixture, building detectors suitable for laser radiation, improving the technique for depositing dielectric thin layers for laser mirrors, and so on. These problems were departure points for later topics. And so, a second most important premiere in the evolution of laser research in Romania was the construction, in 1967, of a high power CO_2 laser (100 W continuous emission). Later on, the research in the field of molecular lasers was oriented in two main directions: increasing the emitted power, and building diversified models which would enable the application of new techniques in research and industry.

Lasers with ionized noble gases play an important role in the development of lasers within IFA. The first model studied and built in 1967 was a pulsed and quasi-continuous operation ionized argon laser.

The third main type of laser -- with a solid active medium -- was first operated in 1968, obtaining a pulsed stimulated emission at 1.06 microns in a neodymium-doped glass rod.

Once the IFA succeeded in working with the principal types of existing lasers, and due to the extremely rapid development of laser applications throughout the world, the first program of activities in the laser field was formulated in 1968 under the guidance of CNST (National Council for Science and Technology) and CSEN (State Committee for Nuclear Energy). This assured a suitable material base for the tasks of this first program, through the establishment and endowment of a radiation and plasma section, today's laser section.

As time went on, the development of lasers throughout the world, and especially the expansion of their applications, made it necessary for us to develop our interests in this field. Assuming some of the demands of the national economy and of society, keeping in mind the directions of development of lasers and their applications, and taking into consideration our own research needs, a much broader research and applications program was conceived for the 1973-1975 period, as well as another long range program for 1976-1980, which is aimed at the pursuit of activities in this field, up to the introduction of research results into microproduction.

One of the main objectives of the vast research program in the laser field, written in 1975, was to first of all build those types of lasers which could be widely applied in the economy and society. This resulted in the construction of a variety of He-Ne lasers with many different operation characteristics, pulsed and continuous frequency-stabilized CO2 lasers, continuous and pulsed operation ionized Ar and Kr lasers, lasers with nitrogen, Cd-He, flash-pumped dyes, neodymium or ruby glass, lasers with different operating characteristics, and so on.

Large Variety of He-Ne Lasers

Because of its specific properties of continuous emission in the visible (red), good coherence and directionality, reliability, and relatively low price, the He-Ne laser is the one chosen for such typical applications as alignment, holography, and interferometry. During the 15 years of scientific and technical research in this field, various types of He-Ne lasers have been built and installed. For instance, alignment devices using He-Ne lasers are seen with increasing frequency at the country's large construction sites. Such devices are being operated at the construction sites of the Lotru hydroelectric plant, the Beia (Brasov) railway tunnel, the smokestack of the Turceni thermoelectric plant (for alignment), and for installing large tanks in the chemical and nuclear industry, for testing soil improvement in agricultural projects, and so on.

No less important is the LG 750 laser, obtained in 1973, which emits 1-3 mW at 0.6328 microns in a single mode transversal structure, and which is designed for laboratory alignments and for optical and holographic experiments. This laser has been delivered to many laboratories in higher education institutes and schools. As a result of technical research conducted in recent years the size of the laser tube and power supply has been reduced, while the reliability and lifetime of the device have been increased; this has made it possible to build, in 1975, a new type of He-Ne laser with integral power supply, the 300-1 TEM00. Actually, two models of this device were built, with the same overall performances: single mode transversal power of 1.5 mW, 2000 hours of operation time, and reduced size. These improvements have made it possible to build laser tubes which emit 7-10 mW in single mode operation, without exceeding the length of the LG 750 laser. This laser is intended primarily for holography, communications, and distance measurements. As to high power lasers, we are presently making a tube which emits 60 mW in single mode transversal operation, and which has a length of about 250 cm and an inner diameter of 3 mm.

Another area of research is that of frequency stabilized He-Ne lasers, with applications in metrology and interferometry. In this respect, we have built a single mode transversal, and single line 0.4 mW laser, with a high degree of spatial and temporal coherence (10 m of spatial length coherence, and a long term frequency stability of better than 10^{-7}).

One application for this laser is in an interferometer which measures the accuracy of displacement of machine-tool carriages. It can measure displacements between 0 and 5 m, with a precision of 2.8 microns/meter and a resolution of 0.1 microns, and digitally display the results of the measurements. This instrument is now in operation at ICPMUA (Institute for Research and Design of Machine-Tools and Aggregates) in Bucharest.

One should also mention that one of our section's first installation of a He-Ne laser was an installation for optical data processing of information obtained from seismic prospecting. It was delivered to the Institute for Geologic Prospecting in Bucharest, and has been operating with good results for several years. In the near future we plan to introduce several types of He-Ne lasers which are already in the prototype stage for mass production, as well as to obtain new models with increasingly good performances.

Power Lasers

The studies which we have been conducting on carbon dioxide lasers have led to the construction of a diversified range of devices which cover a broad field of applications. Some of the characteristics which are common to all these lasers are: they emit in the intermediate infrared (lambda = 10.6 microns), require optical components of special materials, have a high yield, are capable of producing 100 W - 100 kW in continuous emission and energies of

1-100 J in pulsed operation (TEA model with transversal excitation of the discharge at atmospheric pressure), or can produce several watts in frequency stabilized, single mode transversal and single line operation. Because of their relatively high power, these lasers are recommended for industrial applications, as well as for other fields such as communications, plasma production, medical uses, and so on.

Several models of high power, continuous emission CO_2 lasers have been obtained at 150, 300, and 600 W. The industrial type FC-150 laser, for instance, has been delivered to several enterprises and higher education institutes. In the laboratory, they have been used for the vacuum deposition of thin dielectric films and for the spheroidization of refractory materials, while industry has applied them in the controlled cutting of ceramics and glass.

Also interesting is the construction of the device with which the beam of such a laser can be manipulated in any direction, making the laser useful as an optical scalpel in medical experiments on animals at the Medical School of Tg. Mures.

As a cutting instrument, this type of laser has been used to cut glass in U-shapes and along wavy lines, as part of industrial building roofs.

Another, more powerful model is the 600 W laser which is used for cutting and drilling metals from 1 to 30 mm thick, at cutting rates of 1 to 30 mm/sec. Also interesting is the 300 W Z-shaped, small size laser, currently being used to remove electric cable insulation at the Research Center of Electroputerea in Craiova.

One of the scientific applications of continuous emission CO_2 lasers, is the single mode transversal laser without gas circulation, built in a 50 W and a 3 W model. At the same time, we have also built a frequency stabilized, single mode transversal, single line closed laser with an emission power of 3 W, intended for spectroscopic and laser communication applications.

Two types of TEA, pulsed emission CO_2 lasers were built, using two types of excitation electrodes -- a helix type, and a Lamberton-Pearson electrode. The performance of these lasers, used primarily to produce hot plasmas, has improved from year to year, going from a pulse energy of 0.2-0.6 J (1970-1971), to 10 J in 1975, and 23 J this year.

The laser section began studying laser-produced plasmas in 1970. After building lasers suitable for producing and analyzing plasmas, the section entered into actual plasma research. In so doing, we determined dielectric punch-through thresholds in intense laser fields in air and other gases, using beams from Nd-doped glass lasers and CO_2-TEA lasers. At the same time, we also determined the influence of a nearby metal target on punch-through thresholds in gas. These results were exploited by building a laser switching installation for high voltage circuit breakers, which is in operation at ICPE (Research and Design Institute for the Electrical Industry) in Bucharest. In addition, we have also studied the production of plasma on solid targets of Al, C, Fe, Bi, Si, and so on.

In the long range, we envisage increasing the pulse energy of these lasers with a chain of cascaded amplifiers.

We have recently built a pulsed CO_2 laser with transversal preionized discharge, and with a 200 kW electron beam. The large transversal cross section of the discharge will make it possible to obtain energies of the order of hundreds of joules per pulse.

Lasers for Various Applications

For scientific applications, particularly spectroscopy, holography, and communications, we have studied various types of gases for lasers, such as argon, krypton, nitrogen, helium-cadmium. The Ar laser emits at several wavelengths in the green-blue range (0.488-0.515 microns) at a power of 0.5-3.0 W. The Kr laser has produced about 0.5 W in the red range.

The pulsed nitrogen laser was built relatively recently to pump the dye laser, and to analyze the plasma produced by the CO_2-TEA lasers. Its beam is in the ultraviolet (lambda = 0.337 microns) at powers of about 1 mW for pulse lengths of about 1 microsecond.

The He-Cd laser emits in the blue (lambda = 0.442 microns) and ultraviolet ranges (lambda = 0.325 microns) at discontinuous powers of the order of tens of mW. It is use primarily as a light source in spectroscopy.

The studies conducted on these types of lasers has enabled us both to understand the phenomena which determine their operation, and to perfect the technology needed to build them.

In the field of liquid lasers, we have studied a flash-pumped organic dye laser. Its characteristics -- high gain, tunable wavelength, relatively simple construction, low price -- make it especially useful in spectroscopic investigations as a source of coherent light. We have built such a laser in a compact package, with pulsed emission at about 1 ns and an energy of tens of mJ per pulse, and delivered several of them to higher education institutes.

In the field of solid lasers, we have succeeded in building Nd-doped glass lasers which emit in the infrared (0.6 microns), or ruby lasers which emit in the red range (0.69 microns). They are characterized by pulsed emission, at pulse energies of 10-20 J for durations of the order of milliseconds (relaxed operation), or at pulse powers of the order of tens of mW for nanoseconds (triggered or Q-switched operation). These lasers have many varied applications: scientific, in creating and analyzing plasmas, non-linear optics, and holography; industrial, in microprocesses (drilling, welding, cutting, surface evaporation), triggering high voltage circuit breakers; and meteorological, geodesic, medical, and other applications. A prototype of such an Nd laser, designed in 1975 and built by MICM (Ministry of the Machine Building Industry), is now operating at ICPTCM

(Research and Design Institute for the Machine Building Industry). The installation is intended for microdrilling in hard materials and materials which melt at high temperatures (tool steel, vidia [translation unknown], diamond), producing 5-0.8 mm orifices through thicknesses of 10 microns to 4 mm, for spot microwelding at depths of 10-0.3 mm, for surface evaporations, resistor trimming, and the fabrication of integrated circuits. The installation is capable of semiautomatic operation, with the number and rate of pulses programmed by the operator.

Another application of solid lasers is the installation for testing Nd-doped glass rods, delivered in 1975 to the Research Institute for Glass and Fine Ceramics of Bucharest, which is investigating the production of this glass for lasers.

Specific Laser Components and Technologies

The structure of a laser or of a laser installation includes components whose fabrication requires special technologies, which are quite diverse and most often specific, and which must be performed most often with our own means. Examples of some of the most important specific components and technologies are: He-Ne laser tubes whose construction combines the purification of noble gases, high vacuum techniques, glass blowing, physico-chemical processes for washing and outgassing, and precision optics for end-windows; laser mirrors, whose fabrication requires high precision optics, cleaning techniques, vacuum deposition of thin films, and procedures for measuring characteristics; optical components for the infrared (0.6 microns), which imply the production and quality processing of various single crystals (Ge, NaCl, KCl), and single crystals with non-linear properties for modulators and detectors; beam detectors, whose construction requires the development of specific physico-chemical processes; solid amorphous or single crystal materials (Nd-doped glass, Nd-doped YAG, ruby) whose optical homogeneity exceeds the most severe specifications of conventional optics; and so on. Added to these are mechanical components which at times must satisfy specifications for vibration and thermal stability such that a displacement of less than one micron is already unacceptable, and electronics whose performances range between very high speeds (less than one nanosecond) and very high voltages (tens and hundreds of kV). With these in mind, we can obtain a picture of the extremely complex problems involved in the construction of lasers or laser instruments with high performances and reliabilities.

In the technical research conducted at the institute, we have made efforts to develop those processes which can be performed with the resources available both in the IFA laboratories and in collaboration with other institutes. At the same time, within our capabilities, we have tried to build measurement instruments to test laser components.

In what follows, we will briefly present some of the results of our technical research. It is well known that in this field results appear through the slow accumulation of experience and outstanding effort, and that the performance improvements demonstrated by the greater reliability of an instrument, or by the longer lifetime of a component may appear insignificant at first sight.

In the field of He-Ne laser tubes, the completion of research regarding electrodes, optimum gas mixtures, removal of impurities from tubes, and improved radiation output windows, has led to higher powers from shorter tubes with longer lifetimes.

In the field of vacuum deposition of thin films for various optical components (reflecting structures for mirrors, and anti-reflection films for beam transmission elements), we have perfected procedures for all the component types made in our section, and for different types of materials which serve as deposition supports (optical glass, quartz, NaCl, Ge, and so on). Similarly, we have obtained materials with non-linear properties, and perfected an original method for growing from solution single crystals of KDP and ADR (potassium and ammonia dibasic phosphates), which are used in non-linear optics and communications research. With an installation built entirely within our section, we have obtained crystals with a cross section of 30x30 mm and lengths of up to 200 mm. They are utilized in our section for the construction of modulators for He-Ne lasers, electro-optical shutters for Nd-glass lasers, frequency doublers for Nd-glass and ruby lasers, and polarizers for He-Ne lasers, as well as for delivery to other users. In the same vein, we have obtained single crystals of TGS (triglycin sulfate) for infrared pyroelectric detectors for CO_2 lasers.

In terms of measurement and testing instruments for optical components, we have built this year a Fizeau interferometer which uses a He-Ne laser, and which is capable of measuring deviations in optical flats with an accuracy of better than lambda/20 at an aperture of 25 mm. This instrument is composed of elements produced exclusively within our section, its performance being checked with optical flat standards polished in the optical shop of our section.

In the future, we will expand the range of technical problems which we will investigate and solve in our section, and widen our cooperation with other IFA laboratories and laboratories in other institutes to examine other technical problems.

It is clear that the Romanian research in the laser field can be considered fruitful. The demands from research institutes and industry specialists illustrate the successful blend of fundamental and applied research which we have conducted, and confirms the devoted and competent work of researchers in the laser section of the IFA.

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NEW INVENTIONS DESCRIBED

Bucharest STIINTA SI TEHNICA in Romanian Nov 76 p 31

[Collection of articles under the heading: "Romanian Inventions"]

[Text] Thermal Protection Installation for Diesel-Electric Locomotives

The thermal protection installation designed at the Technical Research and Design Institute for Transportation (ICPTT) by Engineer Herlea Apolodor, is composed of a central instrument for measuring the temperature of traction motors, and of system of warning lights for locomotive mechanics. The thermal protection is obtained through a relay contact in the instrument, directly to the locomotive's central protection installation. The installation can be used with any direct current motor, and can protect two motors. Another one of the installation's technical characteristics, is that the alarm temperature can be adjusted between 100 and 200 degrees Centigrade, and the supply voltage is 240 VDC.

The warning and protection output is obtained from a normally open contact. If needed, a larger number of contacts can be provided both for warning and for protection.

The instrument is face-mounted vertically with a collar attachment, and its dimensions are 110x350x125 mm. The warning system is composed of two housings (one in each of the locomotive's control stations) whose dimensions are 100x110x140 mm.

CN Track Circuit

The low frequency, electronic, multi-information track circuit CN-75-6, is a railway safety installation which controls the free or busy condition of track sections, and transmits information along rails, using as signaling current a low frequency carrier pulse modulated by a new coding principle.

CN-75-6 was designed at ICPTT by a collective composed of the young engineers V. Vatasescu, Alex. Lapugean, Dorin Dumitrescu, G. Dragota, I. Schwertner, and Gh. Istrate. It consists of a sender which includes an encoder, and of a transmitter-receiver. The latter includes a sensitivity threshold element, a decoder, electronic relays, a power supply, track relays, and elements for coupling to the track (transformers, current coils, and a filter).

Some of the specifications of the unit are: maximum length (for a carrier frequency of 75 Hz, for instance) 2000 m at r_{Bmin}=1.5 ohms/km and R_s=0.2 ohms; or 1500 m at r_{Bmin}=0.4 ohms/km and R_s=0.06 ohms; assured control of electronic rail interruption; transmission of 18 codes securely protected from each other on a single frequency; secure protection against perturbations caused by any train electric heating system; secure protection against perturbations caused by electric traction currents, including thyristor regulation of traction motors; operational stability in the presence of traction current assymetry, up to 15 A; and a temperature range of -40 °C to +70 °C.

CN-75-6 offers many advantages, among which are: transmission along track cicuits of seven items of information, enabling an interdependence of light signals and automatic signaling in locomotives at speeds higher than 200 km/hr; correct operation of the circuit under large variations of insulation resitance between rails; good protection against perturbations of any nature; electronic equipment composed of circuits with intrinsic safety, high reliability, low power consumption, and no need for maintenance. Moreover, this track circuit can be used both for tracks electrified with alternating current, and for non-electrified tracks.

Instrument for Determining Substances Insoluble in Benzene in Oils

The determination of wear in engine oils is essential for extending the life of engines and assuring their optimum operation. The traditional method of analysis for determining benzene insolubles in oils requires several instruments (centrifugal extractor, analytical balance, oven) and involves several operations which took about four hours.

The new instrument designed at ICPTT by Engineers Alex. Lapugean and R. Scorteanu, and by Chemist Doina Ioachim, performs this analysis in only three operations and in several minutes. Moreover, it requires small quantities of reagents and allows the continuous monitoring of engine lubrication during operation, providing very accurate results.

Determinations with the new instrument are performed by measuring the transparency of a film of oil disolved in benzene. It can therefore also be used to determine the transparency of liquids, smoked or colored glasses, and so on.

Some of the technical specifications of the instrument, which is transistorized and weighs only 2.5 kg, are: 220 V operation, 2 W power consumption, 14 ml/benzene per determination, and an accuracy 3.6 times higher than by the conventional analytical technique.

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ROMANIA

ELECTRONICS ENTERPRISE CREATED BY DECREE

Bucharest BULETINUL OFICIAL in Romanian Part I No 8, 22 Jan 77 p 1

/Decree of the State Council on the Founding of the Electroarges Enterprise for Electronic and Electrotechnical Products With Headquarters in Curtea de Arges city, Arges County/

/Text/ The State Council of the Socialist Republic of Romania hereby decrees:

Article 1. As of 1 January 1977 the Electroarges Enterprise for Electronic and Electrotechnical Products is founded, with its headquarters in Curtea de Arges city in Arges County, under the Bucharest Industrial Central for Electonics and Computing Equipment, under the direction and control of the Ministry of the Machine Building Industry, by merger of the Curtea de Arges Enterprise for Passive Electronic Components, under the Bucharest Industrial Central for Electronics and Computing Equipment, with the Curtea de Arges Electroarges Enterprise under the Bucharest Industrial Central for Electrotechical Materials and Motors, which enterprises are ceasing operations.

The Electroarges Enterprise for Electronic and Electrotechnical Products is organized and will operate according to the legal provisions on the organization and management of the socialist state units, on the principle of autonomous economic administration, and as a juristic person, and it will manufacture passive electronic components, fractionary electric motors, electromotive consumer goods and electric manual tools.

Article 2. The Electroarges Enterprise for Electronic and Electrotechnical Products is in Grade II of organization, and the new subunits that are being founded in the enterprise are in the organizational grades specified in the supplement* to the present decree. The existing subunits retain their approved organizational grades.

Article 3. The inclusion of the Electrotechnical Products Factory (not a juristic person), which is under the Electroarges Enterprise for Electronic and Electrotechnical Products, in Grade III of organization is hereby approved.

*The supplement is sent to the institutions concerned.

Article 4. The assets and liabilities of the merged enterprises, determined according to the balance concluded as of 31 December 1976 and the pertinent plan indices, are hereby transferred to the Electroarges Enterprise for Electronic and Electrotechnical Products.

Article 5. The plan indices of the Bucharest Industrial Central for Electronis and Computing Equipment and of the Bucharest Industrial Central for Electrotechnical Equipment and Motors, for 1977 and the 1977-1980 period, are hereby modified in accordance with the effects of the present decree and determined according to the agreement to be concluded between the two industrial centrals.

Article 6. The personnel of the merged enterprises, who are transferred to the Electroarges Enterprise for Electronic and Electrotechnical Products, are regarded as transferred in the interests of the service and benefit by the provisions and rights specified in Article 21 of Decree No 162 of 1973 on determination of the uniform structural norms for the economic units.

Article 7. Supplements Nos 1 and 2 to Decision of the Council of Ministers No 367 of 1973 on certain measures for reorganization of the industrial centrals, the units comparable to them and some state enterprises are hereby modified in accordance with the provisions of the present decree.

Article 8. The provisions concerning the Electroarges Enterprise that are included in Decision of the Council of Ministers No 724 of 1971, as well as Decision of the Council of Ministers No 1565 of 1972 concerning the founding of the Curtea de Arges Enterprise for Passive Electronic Components, are hereby abrogated.

Nicolae Ceausescu
President of the Socialist Republic of Romania

Bucharest, 20 January 1977.
No 11.

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END